PROCEEDINGS

OF THE

SCIENTIFIC MEETINGS

OF THE

ZOOLOGICAL SOCIETY OF LONDON.

January 5, 1875.

Dr. E. Hamilton, V.P., in the Chair.

The Secretary read the following report on the additions to the Society's Menagerie during the month of December 1874.

The total number of registered additions to the Society's Menagerie during the month of December was 47, of which 16 were by presentation, 17 by purchase, 4 by exchange, and 10 were received on deposit. The total number of departures during the same period, by death and removals, was 104.

The most noticeable additions during the month of December were as follows:—

1. A Campbell's Monkey (*Cercopithecus campbelli*), purchased 15th December.

This scarce West-African Monkey, which was originally described by Mr. Waterhouse in our 'Proceedings' (1838, p. 6), and subsequently figured in Fraser's 'Zoologia Typica' (pl. iii.), is seldom received alive. The present example is a young female. I have only previously seen one other living example of this species.

2. Two Hardwicke's Mastigures (*Uromastix hardwickii*), presented by Lieut.-Col. C. S. Sturt, C.M.Z.S., 23rd December.

3. A young pair of the Pampas Deer of the interior of Brazil and Buenos Ayres (*Cervus campestris*), purchased December 23rd.

This Deer is seldom met with in living collections. We have had no examples of it in the Society's Gardens since 1860.

The Secretary read the following extract from a letter addressed to him by Dr. George Bennett, F.Z.S., of Sydney.

"Sydney, October 22nd, 1874.

"I have sent you a Beetle (*Chrysochroa ocellata*), enclosed in a small box, by this mail. This insect was presented to me by Capt. Payne, of the barque 'William Manson,' by whom it had been captured at sea at a great distance from land. His account of the capture is as follows:—

"'The Beetle was caught by me in the Bay of Bengal in lat. 17° N., and long. 90° E., being at that time the distance of 273 miles from the nearest land, namely the west coast of Pegu. The insect lived for ten days after being enclosed in a small box after its capture.'"

The Secretary exhibited for Mr. Andrew Anderson, F.Z.S., of Futteyghur, an egg and young of the Gavial (*Gavialis gangeticus*), and read the following remarks on them by Mr. Anderson:—

"I send for exhibition by the Secretary an egg of *Crocodilus gangeticus* (*Gavialis gangeticus*). I take this opportunity of pointing out that the word 'Gavialis' should properly be spelt with an *r*, and not with a *v*, the vernacular for the Long-nosed Crocodile being 'Gharial.'

"This egg is one of forty which I dug out of the sand; they were laid in two tiers, twenty below, and twenty above, with a stratum of sand about 1 foot deep between the two layers. Apparently the first batch had been laid and covered over with sand a day or two before the second instalment.

"Also a young Gharial about two months old, to which I acted as *accoucheur*. This is one of several which were kept alive in a tub; they *ran* with amazing rapidity the moment they were hatched. Some of them actually bit my fingers before I had time to remove the shell from their bodies.

"Length (on exclusion from shell) 15·8 inches; snout, from eye, 1·6; between fore and hind leg 2·8; from hind leg to end of tail 9; girth 4. Colour greyish brown, with five irregular transverse bands between fore and hind legs; nine more similar marks across the tail."

A letter was read from the Marquess of Normanby, F.Z.S., dated Government House, Brisbane, Queensland, Oct. 10th, 1874, stating that he had forwarded to the Society in the ship 'Ramsay,' under the care of Capt. Cater, a fine living specimen of the Australian Cassowary (*Casuarius australis*)*.

A letter was read from Sir Victor Brooke, Bart., F.Z.S., pointing out that in his paper on *Cervulus* (P. Z. S. 1874), at page 41, the ninth line from the bottom, the paragraph "Females hornless" down

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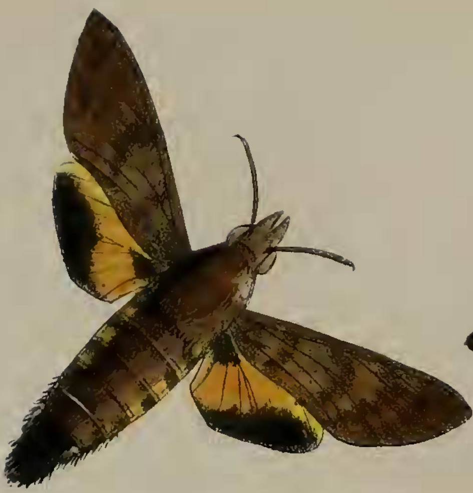
* See below, p. 82.



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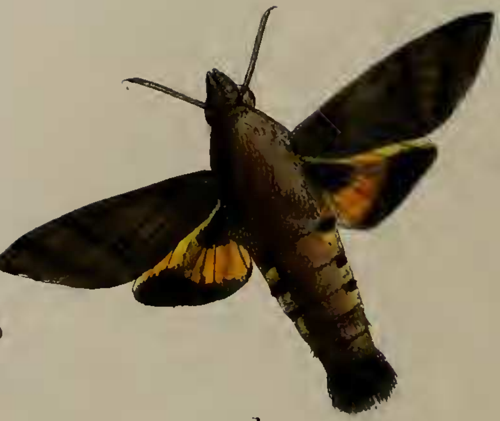

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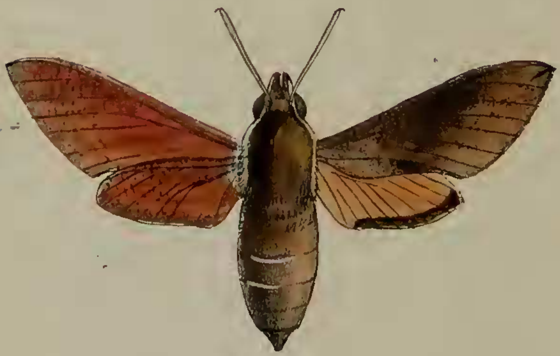

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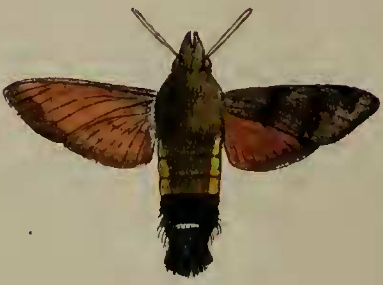

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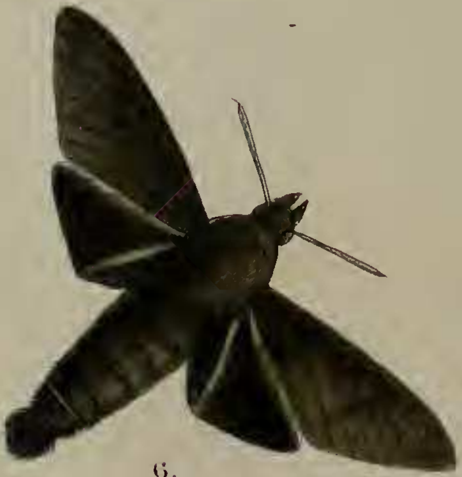

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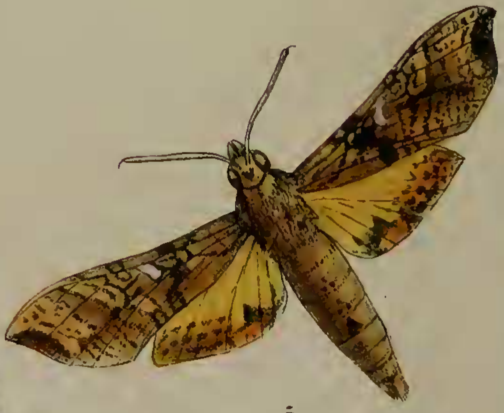

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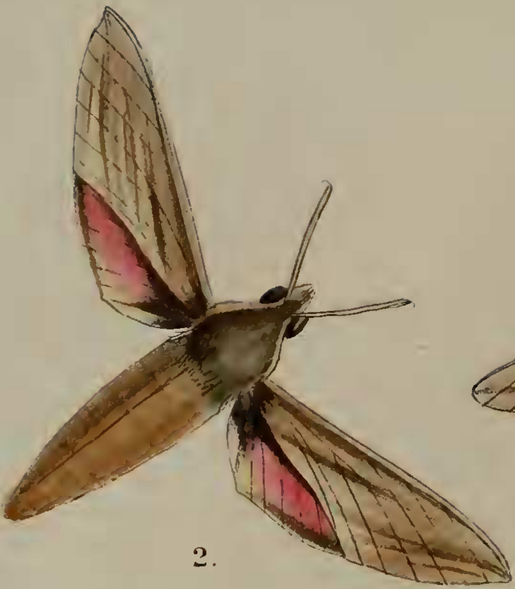
G H Ford

Mintern Bros. imp.

NEW SPHINGIDÆ.

P. Z. S. 1875. Pl. II.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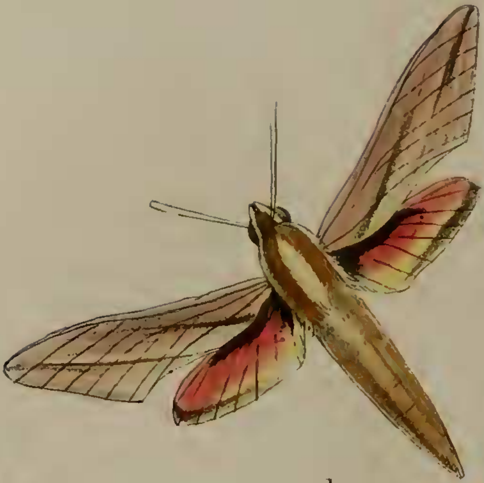
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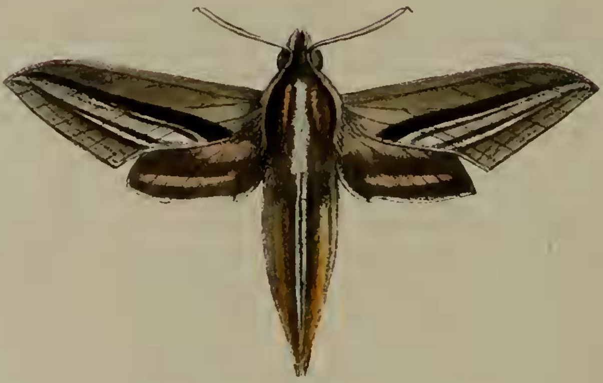
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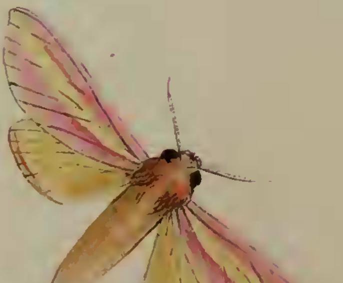
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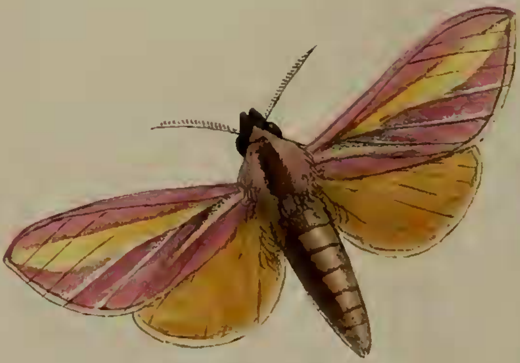
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G.H. Ford

Mintern Bros. imp.

NEW SPHINGIDÆ.

to "metatarsals absent" should have been transferred to page 38 and inserted after the words "project inwards," which occur immediately before "*Cervulus muntjac,*" in the eighteenth line from the bottom.

The following papers were read:—

1. Descriptions of thirty-three new or little-known Species of *Sphingidæ* in the Collection of the British Museum. By Arthur Gardiner Butler, F.L.S., F.Z.S., Assistant, Zoological Department, British Museum.

[Received November 24, 1874.]

(Plates I. & II.)

I have for some time past been carefully working at a complete revision of the Sphingidæ, the results of which labour I hope shortly to have the pleasure of laying before the Society.

Being naturally anxious to secure as many types as possible to our national collection, and knowing that this section of the Lepidoptera is a favourite one, I have thought it best to publish at once characters of the more striking new forms which we possess. This will still leave to my more important paper all the new genera, several new species in the British Museum, two or three that have been kindly placed in my hands by Mr. Lewis, besides others which I hope to obtain through the kindness of Mr. F. Moore[*]. I also hope to figure the early stages of several species already known to science.

Subfamily Macroglossinæ.

Genus Sataspes, Moore.

1. Sataspes uniformis, n. sp.

Closely allied to *S. infernalis*, but differing in the absence of the broad yellow transverse bar at the end of abdomen. Expanse of wings 2 inches 7 lines.

Silhet (*Stainsforth*). Type, B.M.

We have two examples of this species, and I have seen others.

2. Sataspes ventralis, n. sp.

Allied to the preceding and to *S. infernalis*, but differing from both in the bright bronzy green colour of the basal two thirds of primaries; abdomen black-brown, with a dorsal series of pale yellow squamose spots on the posterior area of each segment excepting the basal one; the four apical segments below bright sulphur-yellow. Expanse of wings 2 inches 7 lines.

Hong-Kong (*Bowring*), Silhet (*Stainsforth*). Type, B.M.

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[*] Since the above paper was read, Mr. Moore has most generously placed the whole of his fine collection at my disposal, thus giving me the opportunity of identifying several of his and Mr. Walker's species; he has also lent me several most valuable figures of larvæ, which have been of the greatest use to me.

Genus Macroglossa, Ochsenheimer.

3. Macroglossa fervens, n. sp. (Plate I. fig. 3.)

Primaries above red-brown; basal two fifths chocolate-brown; a transverse nebulous wavy discal bar of the same colour; two transverse subapical blackish spots; secondaries bright ferruginous, costa testaceous; outer margin dusky: head, thorax, and three basal segments olivaceous; these segments orange-tawny at the sides, edged with dark brown; terminal segments dark brown; last segment edged behind with an unbroken transverse line of snow-white scales; a lateral ochre-tipped black tuft; anal tuft dark brown: wings below bright ferruginous, bright ochreous at the base, crossed by several indistinct darker lines; outer margin rather broadly olive-brown; palpi, pectus, and basal segments of abdomen cream-coloured; remaining segments red-brown; central segment with a small lateral white tuft; two terminal segments with lateral ochre-tipped blackish tufts; anal tuft red-brown. Expanse of wings 1 inch 7 lines.

Canara (*Ward*). Type, B.M.

Allied to *M. gyrans* and *M. approximata* of Walker; its position will be between the latter and *M. gilia* of Walker (*walkeri*, Butl.).

4. Macroglossa proxima, n. sp. (Plate I. fig. 1.)

Primaries above dark chocolate-brown, crossed by two diffused sericeous bars; a waved dark-brown transverse streak just beyond the cell; secondaries with basal half sordid ochreous, impinged upon at base by two diverging black basal dashes, and diffused externally; costa broadly bright stramineous, outer margin broadly dark brown: head and abdomen smoky brown; thorax red-brown; sides of abdomen rusty brown, three basal segments with lateral quadrate spots, black internally, broadly orange externally; the three penultimate segments with lateral ochre-tipped brown tufts; last segment but one white-edged externally; anal tuft dark brown, with a broad terminal orange bar: wings below red-brown, ochraceous at base; secondaries with an orange abdominal streak; palpi below sordid white; pectus sordid testaceous, brownish at the sides; legs testaceous, irrorated with brown, the tibiæ of last pair fringed with ferruginous; two basal segments of abdomen ochreous; remaining segments and anal tuft ferruginous internally, dull ochreous externally. Expanse of wings 2 inches 5 lines.

Canara (*Ward*), Ceylon (*Templeton*). Type, B.M.

Some varieties of *M. passalus** nearly resemble this species on the upper surface, but differ in having four distinct transverse blackish lines across the primaries, a much less prominent orange terminal bar to the anal tuft, and an entirely different coloration on the under surface of the abdomen.

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* It is almost certain that the latter are distinct from *M. passalus*, as the typical Chinese form is altogether redder in hue than its Indian representative; but at present I have not sufficient examples to enable me to separate them with certainty.

5. MACROGLOSSA OBSCURA (Horsfield, MS.). (Plate I. fig. 2.)

Allied to *M. passalus*, but duller in colouring, the primaries more acute and longer, the transverse lines less distinct, the secondaries with a broader, more defined, more irregular, and paler central orange band; the three basal segments of abdomen edged laterally with testaceous instead of orange; secondaries below with a sharply defined internal subtriangular patch, pale yellow at base, but becoming gradually orange externally. Expanse of wings 2 inches 7 lines.

Java (*Horsfield*). Type, B.M.

6. MACROGLOSSA TROCHILOIDES, n. sp.

Closely allied to *M. trochilus*, but altogether brighter in colouring, the primaries much darker, the secondaries with well-defined central orange band; outer margin distinct and black. Expanse of wings 1 inch 5 lines.

Sierra Leone (*Foxcroft*). Type, B.M.

This is the Western-African form of *M. trochilus*.

7. MACROGLOSSA NOX, Newman. (Plate I. fig. 6.)

Male. Primaries above black-brown, bronzy greenish in some lights, base and three indistinct wavy bars black; secondaries with the base and outer margin broadly black, central area very dark grey, silvery greenish in certain lights: body ashy black, with a lateral bright steel-blue lustre when the tail is turned to the light; basal and three terminal segments with large lateral black spots; all the segments with small lateral white-tipped black tufts, penultimate segment white-edged; anal tuft black, pale brown at the base, and white at the tip: wings below black-brown, with bronzy greenish reflections, whitish at base; secondaries shot with pale steel-blue towards base, abdominal area bluish white: body smoky brown, thorax paler; prothorax and palpi sordid white. Expanse of wings 2 inches 9 lines.

Rockingham Bay (*Macgillivray*). Type, B.M.

Described by Mr. Walker as the female of *M. micacea*.

Genus CALLIOMMA, Walker.

8. CALLIOMMA LUTESCENS, n. sp. (Plate I. fig. 5.)

Primaries above clay-colour, transversely and irregularly spotted with dark grey in wavy series; an interno-basal dark grey streak: two transverse, angulated, subbasal whitish streaks, beginning on costa and terminating at first median branch, separated by a grey streak, and bounded externally by a zigzag oblique grey bar from costa to inner margin; a subtriangular, whitish, central costal spot, impinged upon by an irregular discocellular silver marking; a whitish costal patch immediately beyond it, interrupted by indistinct grey lituræ; apex somewhat pale; outer margin with a large, subapical, marginal, lunate, chocolate-coloured patch, bordered internally by a pearly greyish nebula; secondaries orange, shining and whitish on costa, but gradually deepening in tint to abdominal margin; outer margin broadly but diffusely ferruginous, irregularly blotched with black, and bounded internally by an undulated blackish line; an elongate, whitish marginal spot near anal angle: body pale clay-coloured; the pterygodes red-brown, tipped with whitish and dark brown on the shoulders; second, third, and fourth segments of abdomen with more or less defined, inverted, V-shaped markings in the middle: wings below altogether paler; primaries with discoidal area dull tawny, internal margin stramineous, external half crossed by transverse series of brown spots, outer margin rather broadly aud irregularly pale brown; secondaries whitish clay-colour, a spot within cell, and five undulated, partly interrupted, transverse lines (the outermost one indistinct and confounded with a sprinkling of scales of the same colour on external area) brown: body clay-coloured, palpi and thorax deeper-coloured; abdomen with two ventral series of central grey spots. Expanse of wings 2 inches 9 lines.

Haiti (*Tweedie*). Type, B.M.

Allied to *C. parce*.

Subfamily CHÆROCAMPINÆ.

Genus PANACRA.

9. PANACRA METALLICA, n. sp.

Allied to *P. mydon*. Differs in its greater size, longer and more acute primaries, with the outer margin well excavated below the apex; apical half much yellower; transverse lines more oblique, not undulated, the central ones very distinct, four in number, angulated just before reaching the costa; secondaries longer, more acute at the apex, the ochreous streak less diffused; body longer, thorax more uniform in colouring, abdomen with the lateral golden streak broader, more distinct; primaries below brown, with the costa and outer margin, a discocellular point, several lituræ in a discal series, one or two more subapical, and a squamose, dentated, subanal patch bright ochreous; disk also varied with red, and clouded at apex and centre with brown; a submarginal series of markings, the two nearest apex white and lunate, one at external angle black and white, ovate, the intermediate ones forming a semi-connected irregular grey streak; secondaries brown, with the costa, outer margin, a spot at anal angle, and a submarginal anal streak bright ochreous, irrorated with red; a bright yellow discocellular point; two irregular, ill-defined, central dark brown lines; disk plumbaginous: body below creamy, speckled with ferruginous; abdomen with a lateral series of black points. Expanse of wings 2 inches 9 lines.

North India (*Parry*). Type, B.M.

This is labelled by Boisduval with his MS. name of *P. mydon*; it is not, however, Walker's type.

Genus DAPHNIS, Hübner.

10. DAPHNIS PALLESCENS, n. sp.

Allied to *D. hypothous*, same general pattern; primaries with the pale rosy whitish bands broader, less distinctly white-edged; the dark markings paler, more olive-tinted; external angle slate-coloured; apical white spot smaller; secondaries whity brown, with a central dark-grey nebula leaving a distinct postmedian in-arched line of the ground-colour; beyond and bounding this is a broad, submarginal, purplish-brown band; outer margin broadly pale brown, darker externally (the submarginal band and the marginal border both narrowest at anal angle): body, with the collar, base, and sides of abdomen whitish; pterygodes olive, head and thorax grey; dorsum of abdomen greyish brown; antennæ pale ochreous: wings below much like *D. hypothous*, but paler. Expanse of wings 3 inches 7 lines.

Queensland (*Janson*). Type, B.M.

Genus Pergesa, Walker.

11. Pergesa aurifera, n. sp.

Primaries olive-green, base transversely spotted with black; a violet-centred black spot at end of cell, and from it to inner margin a nebulous dusky bar; disk more or less clouded with reddish, crossed obliquely from costa to inner margin by three parallel rows of black spots; three large costal subapical black spots; outer margin pearly, irrorated with black; fringe dull ochraceous; secondaries black-brown, costal area pale brown; an anal, submarginal, cuneiform, dull ochreous fasciole: body olive-green, head margined with whitish; pterygodes grey, black-bordered; abdomen with two longitudinal series of black dots, a lateral golden-yellow streak from second segment, and a broad, undulated, golden-yellow lateral border, each undulation with a central black dot: wings below nearly as in *P. castor*, but the black lines and dots heavier. Expanse of wings 3 inches 5 lines.

Sikkim (*Whitely*). Type, B.M.

Var. Primaries and body clay-colour, with a slight greenish tinge.

North India (*Janson*). B.M.

Allied to *P. castor*, but differing (besides colour-characters) in the much more acute falcate form and greater width of the primaries.

Genus Chærocampa, Duponchel.

12. Chærocampa macromera, n. sp.

Nearly allied to *C. elpenor*, but much larger, the primaries duller in colour, with the outer margin more broadly rosy lilacine; secondaries with more than half the wing rosy; body with the dorsal rosy line less defined; wings below with the costal ochraceous border duller, much narrower, only clearly represented towards base; transverse band converted into two narrow parallel lines. Expanse of wings 3 inches 4 lines.

Silhet (*Macgillivray*), North India (*Stevens*). Type, B.M.

Noted by Mr. Walker as a variety of *C. elpenor*; I am satisfied, however (from the fact that the more nearly allied Japanese species is now proved by breeding to be distinct), that it is a different species.

13. Chærocampa gracilis, n. sp. (Plate II. fig. 2.)

Nearly allied to *C. eson*, about one third smaller; the wings and abdomen, as compared with the size of the insect, longer; the primaries decidedly less distinctly streaked, the streaks also narrower; secondaries blacker at base, much whiter at anal angle; lateral streaks of thorax much whiter; abdomen very indistinctly streaked, not showing the two broad longitudinal central brown bands; wings below less irrorated with brown, central oblique lines of primaries not extending beyond the middle of the wing from costa; abdomen below not showing the lateral blackish points. Expanse of wings 3 inches to 3 inches 2 lines.

Congo (*Richardson*), Sierra Leone (*Morgan*). Type, B.M.

We have four examples of this species.

14. Chærocampa elegans, n. sp. (Plate II. fig. 1.)

♂ ♀. Allied to the preceding species (with which it agrees in size) and to *C. theylia*. The male may at once be distinguished from both by its much more acute and narrow primaries; and both sexes may be distinguished by having a distinct, whity brown, longitudinal band from the back of the head to the end of the abdomen, the pterygodes more brightly coloured, and the anal margin of secondaries less excavated. In size it exceeds *C. theylia* by about one half; and the white nebula at anal angle of secondaries is more vivid; on the underside of primaries the terminal grey border is well marked. Expanse of wings, ♂ 2 inches 9 lines, ♀ 3 inches 1 line.

♂, Java (*Horsfield*); ♀, Silhet (*Stainsforth*). Type, B.M.

Mr. Walker says that "*C. eson* in Asia is very generally of small size, and in Africa of large size, but the latter variety also occurs in Asia," *C. eson* and *C. gracilis* being the large African forms, *C. elegans* the large Asiatic and *C. theylia* the small Asiatic form.

15. Chærocampa argentata, n. sp. (Plate II. fig. 3.)

General form and markings of *C. oldenlandiæ*, wings shorter, inner margin of primaries much more excavated, all the brown markings much darker, the silver lines more vivid, the line down the centre of pterygodes and the lateral streaks of abdomen vivid golden sprinkled with reddish scales; primaries more silvery at base, the pale oblique bar of primaries slightly broader, the outer margin somewhat plumbaginous; secondaries darker, the pale streak redder in tint: wings below altogether redder, the markings darker, the outer margin more plumbaginous; abdomen with a white ventral streak. Expanse of wings 2 inches 10 lines.

Moreton Bay (*Gibbon*), N. Australia (*Elsey*), Sydney (*Lambert*), Australia (*Stevenson*). Type, B.M.

This is the Australian representative of *C. oldenlandiæ*; it is undoubtedly a distinct species, but may be an insect described by Mr. Walker of which I cannot find the type. A third species also exists in North Australia; but our example is in such a poor condition that I could not venture to make a type of it.

16. CHÆROCAMPA VIRESCENS, n. sp.

Form, size, and general appearance of *C. crotonis*, but primaries greener, with only the outer, central, broader streak (running from inner margin to apex) distinct, the other lines scarcely visible; yellow spots of secondaries paler, outer margin greener; body greener, without the longitudinal central whitish streak; wings below redder, primaries without the postmedian oblique blackish line; the subapical spots smaller; discocellular spot white; outer margin broadly bordered with reddish grey; base more broadly suffused with blackish; secondaries with central lines very indistinct, reddish; body below irrorated with ferruginous, abdomen with a longitudinal pink streak. Expanse of wings 3 inches 2 lines.

Bogota (*Stevens*). Type, B.M.

Intermediate in some respects between *C. crotonis* and *C. aristor*.

17. CHÆROCAMPA DOCILIS, n. sp.

♂. Allied to *C. amadis*; wings above dull green; primaries with an interno-basal black spot; a minute discocellular black spot; a basi-subcostal spot, a transverse oblique streak crossing the middle of discoidal cell, a nebula just beyond discoidal cell, a transverse subapical litura, an oblique streak (edged internally with silver-grey), and a submarginal row of spots, all olive-brown; a zigzag submarginal greenish-grey line, margined internally with silver-grey; outer margin from zigzag line silver-grey, irrorated with blackish atoms; fringe pinkish, except at external angle, where it is cream-coloured; secondaries with the basal three fifths and a broad submarginal band tapering to and not extending beyond first median branch, black; abdominal area yellowish; head olive-green, whity brown at the sides; thorax olive-green, with a broad central and narrower lateral grey streaks; abdomen clay-coloured, pinkish at the sides, irrorated with black atoms; a double central series of blackish points, as in *C. nitidula*; basal segment olive-green, greyish in the centre, with a large lateral black spot; antennæ cream-coloured; wings below brick-red, irrorated with grey, outer margin irregularly sericeous whity brown; a discal series of black points; primaries with the costa yellow; a blackish subcuneiform patch from base through centre of cell to just beyond discocellulars; two subcostal black spots near apex; secondaries with the costa yellowish, abdominal area whitish: body pink, irrorated with blackish atoms; abdomen with a lateral row of black points; thorax at base of wings golden-yellow; legs pale olivaceous, tibiæ and tarsi of front pair white. Expanse of wings 3 inches 11 lines.

Ecuador (*Buckley*). Type, B.M.

This is a softly coloured and beautiful species.

18. CHÆROCAMPA HAITENSIS, n. sp.

♂ ♀. Allied to *C. nechus*; differs in having the external area of primaries browner, the pale-brown patch towards external angle broader; the sulphur-yellow spots of secondaries smaller; the lateral yellow streak of abdomen replaced by a beautifully shaded, apparently overlapping, series of pyriform yellow and orange spots; wings below altogether redder, the dark areas more restricted and paler, the yellowish markings less vivid, and varied with red; palpi, prothorax, and sides of abdomen irrorated with red. Expanse of wings 3 inches 4 to 6 lines.

Haiti (*Tweedie*). Type, B.M.

Easily distinguished at a glance by the colouring of the abdomen.

19. CHÆROCAMPA IGNEA, n. sp. (Plate I. fig. 4.)

♀. Allied to *C. scrofa*, but primaries and body dull reddish chocolate instead of blackish grey; primaries with all the markings less prominent; wings below bright reddish all over instead of only on basal half of primaries, the outer margins broadly clouded with brownish; body red-brown instead of greyish; palpi and legs varied with white, as in *C. scrofa*. Expanse of wings 2 inches 8 lines.

Moreton Bay (*Gibbons*). Type, B.M.

Although nearly allied to *C. scrofa*, I believe that this species will prove to be constant and therefore distinct; I consider the most important difference to be the coloration of the under surface of the primaries.

Genus AMBULYX, Walker.

20. AMBULYX MOOREI (Boisduval, MS.).

♀. Primaries above dark clay-colour; outer margin broadly brownish, bordered internally by a diffused ochreous line deeper externally than internally, becoming silver-grey towards apex, and limited on internal margin by a brown spot (decreasing upwards, excavated on both sides), and on second and third median branches by indistinct brown dots; a nebulous, oblique, pale brownish subapical streak; several very ill-defined, sinuated, transverse, ochreous lines across and beyond the cell; a geminate, grey, white-pupilled discocellular spot; secondaries testaceous, clouded with clay-colour, especially towards anal angle; costa and abdominal margin creamy; a greyish streak across the end of the cell; an arched discal series of six red-brown lunate spots; outer margin red-brown: body bright clay-coloured; crest, metathorax, and a bar across pterygodes red-brown: wings below ochreous, becoming tawny externally; primaries with the outer margin grey, with a white external and brown internal line; an indistinct discocellular brown litura; several very indistinct brownish transverse lines beyond the cell; secondaries with the outer margin brown; an indistinct discocellular litura and sevaral ill-defined spots beyond the cell pale brown; body below bright ochreous, becoming tawny towards head. Expanse of wings 3 inches 11 lines.

Java (*Horsfield*). Type, B.M.

Most like *A. strigilis* in appearance.

21. AMBULYX MARGINATA, n. sp.

Primaries above whity brown, with a pink tinge; base, two large spots placed obliquely to each other (one costal, the other interno-basal), encircled at a little distance by a slender line, a very oblique transverse line from middle of costa to basal third of inner margin, a large oval spot near base of first median interspace, three central costal spots (nearly equidistant), a large, subquadrate, subapical costal spot, the outer margin broadly, from subapical margin to external fourth of inner margin, a discal nebula on second median interspace, and several indistinct, lunated, transverse lines, olive-brown; secondaries rosy, costa and base cream-coloured; abdominal margin broadly creamy, tinted with pink; outer margin, from subcostal nervure to anal angle, broadly chocolate-brown; two central, transverse, lunulated, grey lines and a discal series of grey dots; body as in *A. gannascus*; wings below altogether yellower than above; primaries with the costa, especially at apex, ochreous; all the large spots, excepting the subapical costal one, missing, the latter paler than above; transverse streaks more distinct; outer margin broadly bordered with silver-grey; secondaries pale clay-coloured; border, lines, and spots as above, but very pale; body as in *A. gannascus*. Expanse of wings 4 inches 7 lines.

Rio Janeiro (*Stevens*). Type, B.M.

Subfamily SPHINGINÆ.

Genus AMPHONYX, Poey.

22. AMPHONYX RIVULARIS, n. sp.

♂. Like a large example of *A. duponchel* ♂, but less green in colour, and with a broader transparent area in the secondaries. Expanse of wings 5 inches.

♀. Like the female of *A. duponchel*, but slightly larger, the primaries green, not varied with mealy-white patches, and with all the markings distinct as in *A. antæus* ♀. Expanse of wings 6 inches 3 lines.

♂ ♀, ——? ; ♂, Ega (*Bates*); ♂ var., ——? (abdomen reddish). Type, B.M.

I have little doubt that this is the Upper-Amazon representative of *A. antæus*, as *A. medor** is the Mexican. Herr Julius Flohr, of Hamburg (who has collected much in Mexico), tells me that he has a female example of the latter species measuring 9 inches in expanse of wing; our female only measures 7 inches.

Genus PROTOPARCE †, Burmeister.

23. PROTOPARCE FULVINOTATA, n. sp.

Primaries above very similar to *P. solani*, but lighter, the subapical pale patch less dusky and broader, and all the transverse dark lines less oblique towards inner margin; secondaries bright ochreous, a subbasal lunule, a broad, transverse, central streak, and a broad marginal border dark brown: body—head chocolate-brown; thorax ferruginous, with posterior black border; abdomen red-brown, irrorated with grey, and spotted at the sides with elongated fulvous spots or lituræ; antennæ whitish above, dull ochraceous below: wings below brown, whitish towards base; fringe white-spotted; internobasal area of primaries ochreous; abdominal area of secondaries whitish; body below sordid white. Expanse of wings 4 inches 2 lines.

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* Cramer's locality is (almost certainly) incorrect; we possess both sexes of his species, distinguished at a glance by its blackish coloration.

† I adopt this name, rather than Mr. Grote's emendation of *Macrosila*, as being one year prior to that genus as first characterized, its type also being indicated as *P. rustica*. For *Macrosila*, Walker, I have retained *M. incisa*, Walker, as type.

South Africa. Type, B.M.

24. Protoparce contracta, n. sp.

♂. Allied to *P. lucetius*; primaries narrower, secondaries shorter, colouring slightly paler, the oblique lines of primaries much less irregular; submarginal line and apical patch much whiter; secondaries with the second brown band running independently across the wing instead of losing itself in the third band, marginal band narrower; orange lateral spots on the body much more rounded, a dorsal blackish line; mesothorax not black; primaries below with the transverse lines more oblique and better defined; secondaries with the transverse lines wider apart, more dentated; marginal border much narrower. Expanse of wings 4 inches 1 line.

Rio Janeiro (*Stevens*). Type, B.M.

Confounded with *P. carolina* by Mr. Walker.

Genus Diludia, Grote and Robinson.

25. Diludia brevimargo, n. sp.

♀. Closely allied to *D. florestan*, but differing as follows:—Smaller; primaries with the outer margin much shorter, more rounded at apex; secondaries also shorter, outer margin excavated above anal angle: in colours it differs in having the primaries much greyer in tint, the transverse bands greener, the marginal black lines of these bands more distinct and more strongly dentated; the black bars on median branches less strongly defined; the apical black-edged area narrower, and very indistinctly sinuated externally; secondaries with the inner transverse black bar very indistinct: body with the head and thorax greenish grey, abdomen less red; marginal black strigæ less strongly defined; wings below darker than in *D. florestan*, transverse bars less distinct and more irregular, the two inner bars of secondaries coalescing. Expanse of wings 4 inches 6 lines.

Brazil (*Becker*). B.M.

26. Diludia rufescens, n. sp.

♀. Allied to *D. lichenea*, primaries altogether redder; the outer margin shorter, more arched; central band much better defined, its outer edge much more dentated; apical patch more elongated; submarginal white streak much more deeply sinuated; secondaries shorter, pale grey, with two indistinct central whitish bars: body more uniform in colouring, head and collar rather redder; lateral abdominal black strigæ less defined: wings below altogether paler than *D. lichenea*, the transverse bars less defined, only two on secondaries. Expanse of wings 5 inches 3 lines.

Rio (*Stevens*). Type, B.M.

Placed by Mr. Walker with *D. lichenea* and described in his first paragraph as the female of that species, the true female being described more briefly in the second paragraph.

27. DILUDIA MELANOMERA, n. sp.

♂. Wings slightly more elongate, altogether much darker; the apical patch black, with a zigzag grey line running longitudinally through it; median band externally bordered and spotted at end of cell with black; submarginal spots black instead of dark grey; secondaries black-brown, a slight double nebulous streak from anal angle: body much darker, head and prothorax blackish; abdomen with lateral bars more continuous and blacker: wings below also darker, transverse lines much darker, more dentate; body below rather paler. Expanse of wings 4 inches 10 lines.

Silhet (*Dale*). Type, B.M.

This appears to be the northern form of *D. discistriga*.

28. DILUDIA VATES, n. sp.

Primaries above light grey, two or three whitish spots on basal half of costa and at centre of discoidal cell, also a double angulated discal series of brownish-edged lunate spots; a small oblique spot towards middle of costa, a less oblique litura crossing the cell near its termination, two parallel streaks within interspaces, a small lunule beneath them, an irregular streak margining the apical patch, and a series of spots at the end of the nervures upon the fringe black-brown; an indistinct discal series of brown dots; fringe partly white; secondaries smoky brown, abdominal area paler; costa testaceous, anal angle grey, crossed by two brown lunules; thorax and head grey; pterygodes margined externally by a black streak; metathorax margined behind by a transverse angulated black streak; abdomen pale brown, with a brownish lateral streak and a dorsal black line: wings below whity brown, external area and a discal bar slightly darker brown; fringe spotted with blackish; palpi varied with white, pectus white; abdomen whity brown; tarsi of front pair of legs blackish. Expanse of wings 3 inches 6 lines to 4 inches.

Ceylon (*Templeton*); Madras. Type, B.M.

Var. Slightly darker, a geminate white spot near external angle of primaries. Expanse of wings 4 inches 4–9 lines.

Silhet (*Sowerby*), Moulmein (*Clerck*). Type, B.M.

Our example from Madras has a label on it, bearing the MS. name *Sphinx vates*. The species is nearly allied to *D. incerta* of Walker, from China; it was confounded, in the collection, with *D. discistriga*.

29. DILUDIA NATALENSIS n. sp.

Primaries above snow-white, varied with grey, two transverse irregular brownish lines crossing the middle of cell; a broad greyish patch, beginning just before end of cell, bounded internally by a blackish streak, and bounded and crossed externally by two lunulated waved transverse lines running from costa to inner margin; two similar discal lines, becoming black below third median branch; a very irregular black streak bounding the apical patch, and immediately below it two interrupted blackish lunules; a central submarginal bifid black-edged grey spot; an ill-defined submarginal streak; a white discocellular spot; outer margin black-spotted; secondaries smoky brown; abdominal area testaceous; outer margin dark brown, broadest at apex; a pyriform dark brown streak on abdominal area, continued laterally as an indistinct brown streak crossing the centre of wing; anal angle white, interrupted by two marginal semicircular blackish spots and an irregular submarginal grey streak: thorax pale grey, collar dark grey behind, pterygodes bordered externally with black; metathorax margined behind with blackish; abdomen whity brown, with lateral oblique dark grey and white strigæ on each segment: wings below tinted with ferruginous, a common lunulate and waved discal streak; primaries with a black costal streak just beyond the end of cell; an interrupted submacular brown streak just beyond the discal streak, an oblique white spot at apex; fringe spotted with brown; secondaries crossed above the middle by an oblique diffused brown bar; a brown streak at apex and anal angle, fringe spotted with ferruginous; body whity brown, palpi and pectus white. Expanse of wings 5 inches.

Port Natal (*Gueinzius*). Type, B.M.

This species somewhat resembles the preceding in general appearance; but the outer margin of primaries, instead of being convex, is distinctly excavated above external angle. Our example bears a label by the collector bearing the following inscription:—"*Acherontia spei* ♂. Only two ♀ specimens taken in 1857 (one of them lost). I have not observed that peculiar chirping noise; had they chirped I am sure I would have observed. Query, Does the ♂ only chirp? and the ♀ not?—*W. Gzs.*"

I have not thought the MS. name applicable, and therefore have not used it.

Genus NEPHELE, Hübner.

30. NEPHELE ROSÆ, n. sp.

Wings above olive-green; primaries with the base, a broad transverse band leaving a large quadrate costal spot, a small spot between the latter and the base upon inner margin, and an irregular band beginning broad at apex, undulated and narrowed externally to upper radial, then abruptly and deeply excavated to external angle, its inner edge straight and with a pale border, all dark brown; a postmedian squamose snow-white streak bounding the broad subcentral transverse band; a snow-white point on lower discocellular, and two at base; secondaries with the costal area testaceous; apical half of wing dark brown; fringe testaceous: body olive-green, head greyish brown; abdomen paler at the sides, with five transverse black bars, the first three broadly interrupted in the middle; anal tuft red-brown; antennæ testaceous: wings below altogether paler and browner than above, the transverse white streak and basal points of primaries absent, discocellular point smaller, secondaries crossed by three central brown lines; body below sordid whitish, pectus greyish. Expanse of wings 4 inches 1 line.

"Boma, Feb. 1873" (*Monteiro*). Type, B.M.

This handsome new species is allied to *N. œnopion*; it was the only example taken, and was, I believe, captured by Mrs. Monteiro, after whom I have named it.

31. Nephele variegata, n. sp.

Primaries—base of wings grey-brown, varied with clay-colour, with two discoidal whitish dots, bounded externally by an irregular transverse grey-clouded whitish band, divided through the centre by a blackish line; a broad central oblique greyish brown band, varied with clay-colour, bounded on each side by two irregular black lines and constricted in the middle; three silver spots at end of cell; immediately beyond the central band is a narrower band, whitish at costa, otherwise grey, intersected and bounded externally by lunated blackish lines; discal area ochreous towards costa, otherwise dark brown varied with clay-colour, a very irregular undulated submarginal blackish line bordered externally by a grey line; outer margin reddish brown; secondaries olive-green, outer margin (except at anal angle) with a broad brown border tapering from costa to submedian nervure; fringe testaceous: body dark brown, pterygodes tipped with pale yellow scales; abdomen with six broad transverse lateral black bars separated by pale yellow lines; primaries below brown, dull olivaceous at base, crossed at the middle by an oblique nebulous dark brown bar, disk crossed by two waved undulated dark brown lines, and an arched undulated submarginal line; a white discocellular point; secondaries pale olivaceous, with the outer margin brown, three central undulated and a submarginal irregular dark brown lines; body greyish brown, palpi paler. Expause of wings 3 inches 7 lines.

Congo (*Richardson*), Africa (*Milne*). Type, B.M.

This is *Z. peneus* (part.) of Walker, *Z. funebris*, Boisd. (nec Fabricius).

Subfamily Smerinthinæ.

Genus Leucophlebia, Westwood.

32. Leucophlebia rosacea, n. sp. (Plate II. fig. 4.)

♂. Allied to *L. lineata*; primaries dull glossy rose-colour, a broad ochreous streak parallel to costa, broadest opposite external angle, and acutely pointed at each end; an oblique submedian basal ochreous streak, median branches silver; fringe golden; secondaries deep ochreous, fringe testaceous; body—palpi and vertex chocolate-brown, back of head and sides of thorax pale sordid rose-colour; centre of thorax chocolate-brown; abdomen pale brown; antennæ cream-coloured above, ferruginous below; wings below as in *L.*

lineata, but altogether deeper in colour, and with a slender marginal plum-coloured line; body and legs below chocolate-brown, abdomen with a rosy tint. Expanse of wings 2 inches 7 lines.

Coimbatoor (*Walhouse*). Type, B.M.

33. Leucophlebia bicolor, n. sp. (Plate II. fig. 5.)

♂. Primaries rosy, a broad central longitudinal tapering stramineous streak from base to apex, nearly straight in front, arched behind, and having three processes along the median branches; fringe stramineous; secondaries ochreous; costa and abdominal margin stramineous, outer margin rosy, fringe stramineous; thorax dull rosy, deeper in front than behind, with a central ochreous spot: body whitish ochraceous, rosy at the margins; antennæ above creamy whitish, below brownish: wings below stramineous; primaries with discoidal area ochreous; apical costa abruptly and broadly rosy, outer margin with a broad pale rosy border, tapering to apex; secondaries with costa and outer margin pale rosy; body dull pale ochraceous, with a rosy tint, gradually becoming more intense to the head; palpi dull rosy; legs creamy above, rosy below. Expanse of wings 2 inches 2–3 lines.

Almorah (*Boys*), N. India. Type, B.M.

Allied to *L. emittens*, but coloured more like *L. lineata*.

EXPLANATION OF PLATES I. & II.

Plate I.

Fig. 1. *Macroglossa proxima*, p. 4.
2. —— *obscura*, p. 5.
3. —— *fervens*, p. 4.
4. *Chærocampa ignea*, p. 10.
5. *Calliomma lutescens*, p. 5.
6. *Macroglossa nox*, p. 5.

Plate II.

Fig. 1. *Chærocampa elegans*, p. 8.
2. —— *gracilis*, p. 8.
3. —— *argentata*, p. 8.
4. *Leucophlebia rosacea*, p. 15.
5. —— *bicolor*, p. 16.

2. Corrections of and Additions to "Raptorial Birds of North-western India." By Andrew Anderson, F.Z.S.

[Received November 30, 1874.]

(Plate III.)

Since the publication of my last paper*, my knowledge of this subject generally has been greatly advanced, not only by furthur research, but by the acquisition of European and African specimens of some of the species concerning which comparatively little was known

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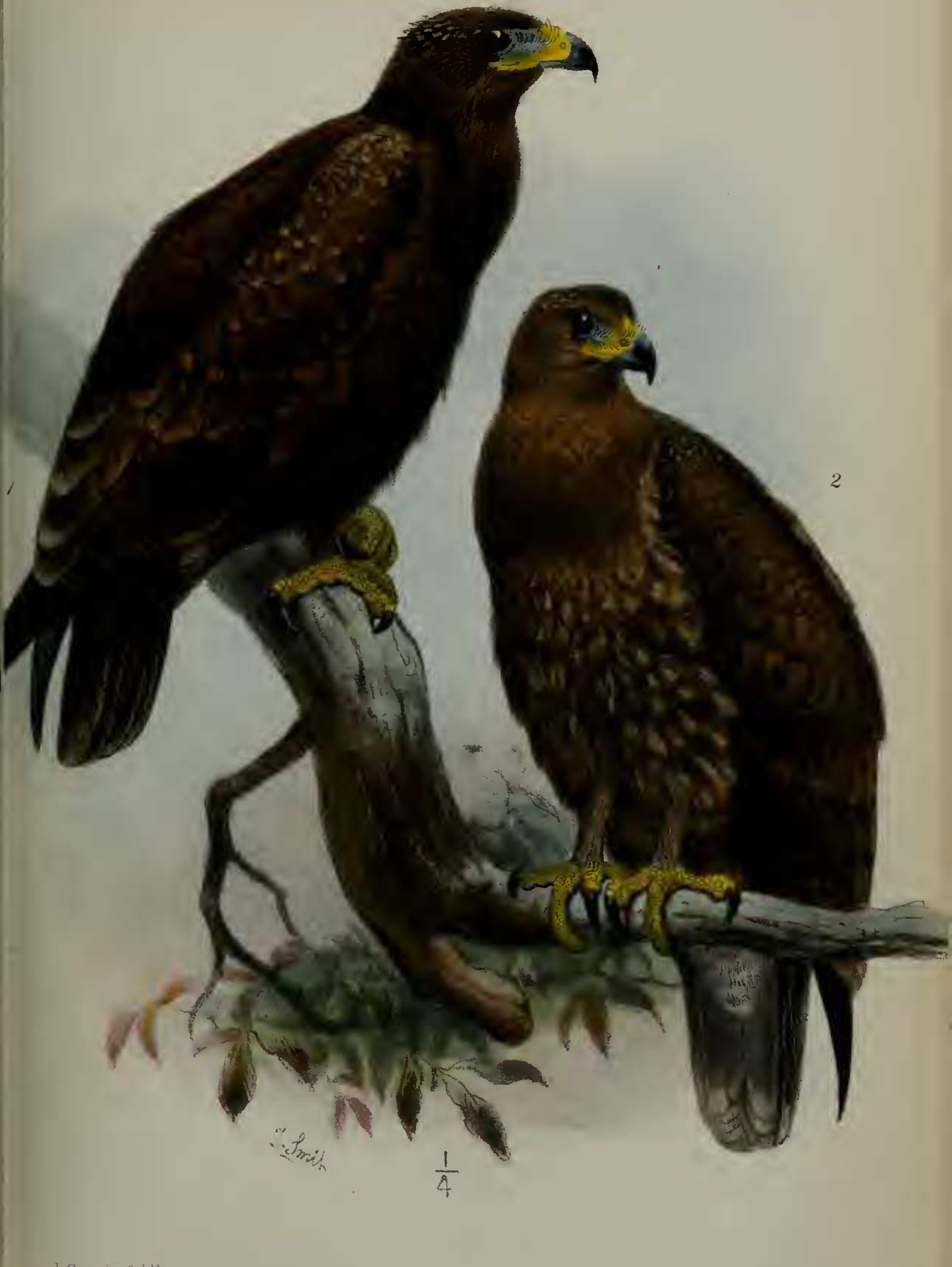
* P. Z. S. 1872, p. 619.



J. Smit del. & lith.   M&N Hanhart imp.

AQUILA HASTATA 1 ad. 2 jr.

up to that date. The result is that I, or rather ornithologists generally, have to acknowledge certain errors consequent on a limited knowledge of a most difficult group of birds. At the same time I am glad to be able to introduce several new species as occurring in the country to which my observations have been confined, viz. the *dèltaic* portion of the North-western Provinces, thus making (with the necessary corrections and additions) no less than 48 species of Raptores known to occur in this district.

This is the number that have as yet come under *my own* observation. But further investigation will doubtless enable me to add several more, such as *Falco babylonicus*, *Haliaetus plumbeus*, &c.

Additions to former lists are indicated by an asterisk, *.

1. Vultur monachus, Linn.

All the specimens examined by me have a light fulvous nuchal patch, almost white; but the authors of the 'Birds of Europe' do not allude to this peculiarity in the Indian bird, nor is it shown in the plate.

2. Vultur calvus, Scop.

On the 15th of July, 1872, my friend Mr. Spry took an egg, flushing the bird off her nest, which also contained an egg of *Falco jugger*.

*3 *bis*. Gyps fulvescens, Hume.

The large fulvous-coloured Vulture already alluded to I identify as belonging to this species, and not to *G. himalayensis* of the same author.

5. Gyps bengalensis, Gm.

Last cold season I found a small colony of these Vultures breeding on a clump of high cocoa-nut palms (*Cocos nucifera*), whence I obtained four eggs. I have also lately taken *three* eggs from *one* nest, and *two* from another, but of course not the produce of the same birds. The tree on which these nests were built was the rendezvous of a large assemblage of these useful birds, which were attracted to this solitary tree by the carcass of one of the mail-cart horses which had died on the roadside.

6. Neophron ginginianus, Lath.

Captain Beagin, of H.M. 105th Regiment, has lately sent me a series of Neophrons from Aden, which appear to be referable to the African form *N. percnopterus*, Linn. The skins are badly put up, and they are not sexed; so that the minute differences pointed out by Blyth † cannot be compared with Indian examples. The series comprises both black-billed and black-clawed examples, which predominate, as well as white ones, so that this one difference cannot seemingly hold good; but the corneous portion of the bill, as well as the claws, when black are certainly of a much *deeper black* in the Aden than in any Indian-killed examples having the same peculiarity; and in India, according to my experience, the opposite variety, viz. the white-billed ones, predominate. There is no reason why both forms should not intermingle at Aden. The specimens I allude to have their claws quite worn away, caused, no doubt, by the rocky nature of the ground.

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† *Cf.* 'Ibis' for 1866, p. 233.

8. Falco peregrinus, Gmel.

On the 11th of February last I saw a Peregrine actually hunting by moonlight: the full moon was high up in the sky; and several stars had been visible for fully half an hour. Returning homewards to my camp through a marsh, I was startled by the sudden appearance of some ducks (*Anas pœcilorhyncha*), which dived simultaneously with their splash into the water. The Falcon towered overhead and then flew backwards and forwards several times over the same ground, almost skimming the surface of the water.

The following morning I had several shots at this bird, but without success; the native fowlers who were engaged in netting wild fowl assured me that they had seen her at that one place for a long time, and that she invariably roosted on a large bough of a mango tree, close to the edge of the jheel.

The crepuscular habits of this Falcon have not been recorded before, so far as I am aware of.

9. Falco peregrinator, Sund.

On the 19th of November last I procured another specimen of this beautiful Falcon, making in all three females. This appears to be a fully adult bird: the head, nape, and cheek-stripe are almost black, and only one or two feathers are wanting to make it into "*atriceps*" of Hume; upper plumage generally slaty blue, getting lighter towards the tail-coverts, the whole of the feathers being more or less barred with blue of a darker shade; tail unicolorous with the back, and barred with dark slaty blue; chin, throat, and upper breast unspotted white, tinged with buff; from sternum downwards bright ferruginous rufous, barred on the flanks, and spotted on the abdomen with slaty blue; tibial plumes greyish, tinged with lavender, and minutely barred with blue of a light shade.

The Shaheen alluded to in a former paper (P. Z. S. 1871, p. 678) is an immature bird: the whole of the upper plumage generally, including the tail, is dark cinereous or dusky black, the feathers of the back being edged with rufous, and the tail barred with the same colour; the upper tail-coverts are blue, thus indicating a transitional stage; chin, throat, and upper breast as in the mature bird, but the feathers are dark-shafted; lower breast, flanks, sternum, and tibials bright ferruginous rufous, the breast and flanks having longitudinal brown stripes, the sternum and tibials slightly barred with light blue.

Of the varied country of the Doab the enormous jheels, woods, and plains have each its representative Falcon: the Bhyree affects swamps, the Shaheen wooded regions, especially in the vicinity of large trees, where Pigeons and Parrots are in the habit of roosting, while the Jugger delights in dry plains.

16. Lithofalco chicquera, Daud.

At Jelallabad, in the Shabjehanpore district, I came across three pairs of these Falcons, which were nesting within sight of each other; two of them had built on trees only a few yards apart. These nests contained one and two eggs each; and although I halted for the express purpose of obtaining full clutches, the Crows forestalled me. One nest escaped from these marauders, and enables me to add something new in the domestic economy of the Toorumptee; for in this instance she had appropriated an old nest of the Crow.

23. Micronisus badius, Gm.

In modification of any former experience, I have now to record the occurrence of a *slightly* marked egg from a clutch of three.

Five out of six nests which were taken in my presence this last summer were built on the parasitical shrub (*Loranthus globosus* ?) which grows to such perfection on mango trees. The branches of this so-called mistletoe radiate sidewards and upwards to a considerable height above the parent tree, from a large excrescence or knob, thus forming, as it were, the outer structure of a ready made nest. Viewed from below the nest looks about the size of what the common Crow would build; but on examining one I had cut down (the parasitical plant was four feet above the tree), it was clear that the nest itself was particularly small, and so clumsily made as to fall to pieces on being removed from the knob which supported it. A better situation for a nest than the centre of a clump of this parasite could hardly be conceived.

*25. Accipiter virgatus, Temm.

On the 3rd of October last a Shikaree brought me a living Hawk, which he had just captured with bird-lime, and which is undoubtedly referable to this species. It is the first capture of this interesting bird that I have heard of in this part of the country. The person from whom I got it tells me that the Besrah is frequently trapped early in the winter. They certainly must pass through the plains on their southward migration, as Wallace gives it from Malacca, Java, and Sumatra, and Hume has recently recorded it from the Andamans.

Not wishing to be too confident of my own identification, I have waited till the acquisition of more examples, and the opinion of ornithologists who had more experience than myself as regards *A. virgatus*, could be brought to bear on the subject. A pair kindly sent to me by Mr. Mandelli, of Darjeeling (and in precisely the same plumage as my own), leaves no further room for any doubts. Mr. Hume, too, who expressed a wish to see the birds I called "*A. virgatus*," has returned them to me with an expression of opinion to the effect that he fully concurs with me in my identification.

While the long, slender tarsi, diminutive bill, and more *game-looking* appearance of *A. virgatus* is sufficient to separate it from its plebeian ally *Micronisus badius*, the coloration of the *upper* plumage in the *young* birds of both species is very similar indeed, being what I should call the rufous-brown stage. All the feathers on the mantle are of a rich brown colour, tipped and edged with dark rufous, the edgings being broader in *A. virgatus* than in *M. badius*; the former differs also in having *four broad* caudal bands, while the latter has *five* or *six narrow* ones.

The *under* plumage of the two *juvenile* birds is very different in *A. virgatus*: from the chin to the vent it is a rich buff colour (Jerdon calls it white), the feathers of the neck, breast, and abdomen having longitudinal drops of *reddish* brown; the flanks and tibial plumes are broadly *barred* with the same colour; in *M. badius* the underparts are *white*, each feather having a central stripe of brown.

The plumage of the *adult* birds of both species differs *in toto*: the Darjeeling specimen has the head and back of a slaty black colour, the collar and tail being of a smoky brown; there are four caudal bands of the same hue as the head; the under plumage is *white*, *broadly* barred with *bright ferruginous*: the adult Shikra has the mantle of a light ashy grey; and the underparts are *minutely* barred with rufescent or fawn-coloured marks.

The bill in *A. virgatus* is very dark, almost black, the cere dark greenish yellow; in *M. badius* the bill is horny blue, and the cere yellow, without any green; the legs and feet in the former are greenish yellow, the back of the tarsi and soles being yellow; in the latter these are yellow without any tinge of green. The subjoined table of measurements of an immature male of each species will be found useful:—

Species.	Length. in.	Wing. in.	Tail. in.	Tarsus. in.	Foot, greatest length. in.	Foot, greatest breadth. in.
Accipiter virgatus	10·5	6·3	5·3	2·1	2·6	2·3
Micronisus badius	12·0	7·0	6·0	1·8	2·6	2·1

27. Aquila mogilnik, J. G. Gmel. (=*A. crassipes*, Hodg. MS.[*]).

On the 8th of March last I procured a third example of the *Eastern* Imperial Eagle in the *transitional* stage, a huge female of the following dimensions:—Length 32·5; wing 23·5; tail 13; expanse 7 feet; tarsus 4·2, thence to end of mid claw, along the curve, 4·1, outer claw *as above* 3·2, inner claw 3·8, hind claw 3·6; expanse of foot (length) 6·5, (breadth) 5·5; bill along curve 3; height of both mandibles at base 1·2, width at gape 2·2. Weight just over 9 lb. This specimen, while yet in the striated stage, has several rectrices of the adult bird, and the breast has assumed a black-brown appearance in patches. In the course of a very short time this bird would have become exactly similar to No. 4 of Mr. Dresser's series (see his article on this Eagle), *i. e.* the adult bird *minus* the white scapulars.

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[*] *Cf.* 'Ibis' for 1873 p. 99.

The first two changing Imperials which proved the key towards the solution of this (hitherto) vexed question* are now in the Norwich Museum, and form Nos. 2 & 3 of the series alluded to at p. 2 of 'Birds of Europe.'

The Abyssinian Eagle referred to by Dr. Finsch under the term "*imperialis*"† is of course *A. mogilnik.* Very recently an immature example of the same bird was sent to me from Aden; it flew against the telegraph-wire and was captured alive.

27 *bis*. AQUILA BIFASCIATA, Gray & Hard.

On account of the recent discussion that has taken place‡ relative to the distinctness or otherwise of *A. orientalis* from *A. bifasciata,* I have secured a very fine series of this Eagle. The acquisition, too, of several specimens of this bird from Russia (labelled *A. clanga,* by which term it is known to continental naturalists) has afforded Mr. Brooks and myself another opportunity of reexamining the large series at our command; and we still hold to our former opinion, viz. that as regards coloration in every phase of plumage, including the adult bird with the nuchal buff patch, the two Eagles are *identical.*

It is true that the European-killed examples we examined are a *trifle smaller,* the wing-measurements of the males being *half* an inch and in the case of females *one* inch less than Indian specimens. But against this (admitted) trivial difference, as regards size, in a bird measuring up to 32 inches in length, it should be borne in mind (1) that no reliance can be placed on the sexing of birds that are obtained from dealers (especially in *this* Eagle, for I have repeatedly found large males running into females), and (2) that in all probability the smallest specimens are sent out to this country, the largest, and consequently the best in the estimation of dealers, being retained for European collections. Colour is another point mooted by Mr. Gurney; but this really goes for nothing, seeing that in this country we have *dark* birds as well as light-coloured ones; and I possess specimens that have been bleached to a rufescent sandy colour.

Mr. Gurney has been so good as to inform me that he has reexamined the type of *Aquila amurensis,* Swinhoe, and that he has no doubt that it is an adult female of *A. bifasciata.* Such being the case, the wing-measurement as given by Mr. Swinhoe §, viz. 26¼ inches, must surely be wrong; for I have never yet seen more than a 24-inch wing in this Eagle.

Referring to the concluding portion of Mr. Gurney's letter in 'The Ibis' for 1873, page 99, I may mention having recently sent to him a very fine female *A. bifasciata* in the phase of plumage he therein alludes to. The peculiarity observed by Mr. Gurney is more more or less common in all immature birds; and the specimen I have sent to him, though freely "*barred with alternate bands of white and stone-coloured brown, &c.,*" on the under surface from the sternum to the vent, has the fulvous nuchal patch nearly fully developed, thus showing that in Eagles no fixed rule can be laid down as regards the successive phases of plumage, and that some birds may develop signs of maturity while yet retaining their juvenile garb.

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* *Cf.* P. Z. S. 1872, pp. 620 & 621.

† *Cf.* Trans. Z. S. vol. vii. p. 201.

‡ *Cf.* 'Ibis' 1873, pp. 422 & 423, and 'Stray Feathers,' vol. i. p. 325.

§ *Cf.* P. Z. S. 1871, p. 338.

28. AQUILA NÆVIA, Gm.

Specimens of this Eagle from Russia, kindly sent to me by Dr. Crowfoot of Beccles (to whom I am also indebted for *A. bifasciata*), are identical in every respect with Indian birds.

In my former papers I alluded to only two stages of plumage, viz. the "*spotted,*" and the "*uniform brown.*" I now find that very young birds (judging from the amount of spots on them) have the under surface striped or lineated in exactly the same manner as the young of *A. hastata*. I also possess a remarkably fine specimen of *A. nævia* without a single spot, which has the head and neck of a pale sandy colour, almost white.

29. AQUILA VINDHIANA, Frank. (=*A. fulvescens*, Gray, *apud* Jerdon*).

This Eagle has now had its proper name restored to it—the term "*fulvescens*" (by which it has hitherto been known) having been applied to a very different bird, and one with which (until very recently) the true African *A. nævioides* had been confounded. I can corroborate what Mr. Brooks has already written on this subject, viz. that "*no two Eagles could be more truly distinct* (than *A. vindhiana* and *A. nævioides*), *though they are closely affine and structurally alike,*" as I have recently examined the bird sent to him by Dr. Tristram along with a very fine South-African example which Mr. Gurney has been so kind as to forward to me.

Aquila vindhiana and *A. fulvescens*, according to our present knowledge, are purely Indian, while *A. nævioides* (vera) does not occur in India.

29 *bis*. AQUILA FULVESCENS (vera), Gray,

is the bird that has hitherto been wrongly identified with the true *Aquila nævioides* (Cuv.), and which does not occur in India. The Abyssinian Eagles alluded to by Finsch and Blanford† under the synonyms of "*rapax*" and "*albicans*" (="*nævioides,*" Cuv.) require further examination with reference to our present knowledge of the subject. Neither of these authors refers to the *party-coloured* plumage which is so characteristic of this fine bird.

Aquila fulvescens is certainly the rarest Eagle in India; and we are in profound ignorance of its summer habitat, nidification, &c. I have not heard of another capture since the *ten* that were recorded in my former paper (P. Z. S. 1871, p. 688).

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* *Cf.* 'Stray Feathers,' vol. i. p. 463.

† *Cf.* T. Z. S. vol. vii. p. 201, and 'Geol. & Zool. of Abyssinia,' p. 295.

30. Aquila hastata, Less. (Plate III. figs. 1 & 2.)

An account of the nidification of this Eagle has already appeared in 'The Ibis;' and the nestlings which I brought down from Saharunpore enable me to supply the missing link as regards the early stages in the plumage of this interesting bird.

Besides the three already referred to, I have recently had an opportunity of examining two more which Mr. Brooks has this season taken from their nests; and as the young birds appear to be subject to a good deal of variation in the amount and distribution of their spots &c., I proceed to give *general characters* instead of confining myself to the description of a *single* specimen only.

Description of fully-plumaged nestling between three and four months old.—Length 23·5 inches, wing 16·5, tail 9·5, tarsus 3·7 (bird apparently not fully grown). Bill black, plumbeous blue towards the base; cere and gape bright yellow; feet dull yellow; claws black; irides dark brown.

Above rich glossy brown; feathers on the top of the head and hind neck tipped with fulvous; upper tail-coverts light brown, barred with white; scapulars, ridge, bend of wings, and wing-coverts tipped with fulvous spots of a larger size; wing on being opened out shows two, and sometimes three bands, caused (as the case may be) by the greater wing-coverts, secondaries, and tertials being broadly edged with fulvous and greyish white, shaded off in the latter into the darker part of the feathers; primaries uniform black; secondaries brown, profusely barred with hoary grey; tertials pale brown, similarly barred and broadly edged with greyish white; tail dark brown, broadly edged with greyish white, and barred with dark grey.

Beneath brown, the pectoral and abdominal feathers having central and terminal stripes of rich fulvous; the under tail-coverts and tibial plumes are broadly barred with fulvous of a lighter shade.

Description of nestling after the first moult, when about eighteen months old.—Colour of soft parts and dimensions the same; but the primaries and tail-feathers do not appear to be fully grown.

With the first moult the bird assumes a much darker colour throughout, and loses a good many of the spots on the wings and scapulars, but not those on the head; these, it seems, disappear gradually; and the "*entirely spotless*" stage (P. Z. S. 1872, p. 623), in all probability, is not assumed before the third or fourth moult. Although the bands on the wings have nearly vanished, the spots on the shoulders have reappeared in a more decided form, being larger, darker, and somewhat confluent along the ridge of the wings; the upper tail-coverts have become darker, and are now free from bars; the secondaries, tertials, and tail-feathers still retain the bars which are so characteristic of the younger stage; and these, too, may not wholly disappear before several moults.

The chief feature, however, in the second stage is the *disappearance of the striation on the under surface*; the colour below is now of a uniform *dark* brown, with the exception of the feathers between the thighs and the tibial plumes, which still retain a few indistinct fulvous transverse marks.

The "*delicate yellow-brown*" stage (referred to P.Z.S. 1872, p. 622) is, after all, the plumage of the *juvenile or nestling bird*; for mine, while in confinement, began to fade, and to assume a very light colour (in the nestling plumage); and under the influence of the sun the change of course would have been far greater. The amount of spots, and even the striation below, in this early stage, is subject to considerable variation; it is only the nestling birds which turn "*yellow-brown*," as they are exposed to the influence of the sun and rain during the trying months of June to October before they are fully fledged; and in these faded or "*yellow-brown*" examples the spots and striæ are sometimes nearly wanting.

I may mention that I too pronounced the small Danzic bird, sent out to this country as *A. nævia* by Mr. Dresser, to be a fully adult example of *A. hastata*, without, at the time, knowing that Mr. Brooks had arrived at the same conclusion†.

*31. Aquila pennata, Gmel.

The capture of a beautiful adult male on the 22nd of January last enables me to throw some more light on the plumage of this little Eagle.

The three birds in my collection appear to me to come in the following order:—

No. 1 has the whole of the under surface of a uniform rich reddish brown, all the feathers with the exception of the tibial plumes being dark-shafted.

No. 2 has the throat and the upper breast buffy white, the feathers dark-shafted as in No. 1; lower breast and tibial plumes almost white, tinged with buff.

No. 3 has the throat, upper breast, sternum, and tibial plumes white, tinged with fulvous, the feathers generally broadly centred with rufous.

The signs of adolescence in this Eagle evidently show more in the under than in the upper surface; for no. 2 is certainly an older bird than no 1, and yet the two, laid side by side, back uppermost, are quite inseparable. No. 3, which I take to be fully adult, has the head and neck of a rich reddish buff, the feathers on the occiput being broadly centred brown; the upper plumage generally is light brown, the wing-coverts and scapulars being broadly edged with buffy white. No. 2 has some brown feathers on the flanks, clearly indicating that the brown below is the early or first plumage. The following measurements will show the comparative dimensions of both sexes:—♀, length 21·5 inches, wing 16, tarsus 2·8; ♂, length 18·5, wing 14, tarsus 2·5.

38. Circaëtus gallicus, Gmel.

I have lately sent an account of the breeding of this bird to Mr. Dresser.

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† *Cf.* 'Stray Feathers' for 1873, p. 327.

I have had access to Mr. Hodgson's drawings, and find that while he has figured the *adult* bird under the name of "*tarsatus*," he does not appear to have seen specimens in the *striated* or *spotted* stages.